

CLAIMS:

1. An occlusion device comprising:
 - a left side;
 - a right side spaced from and connected to the left side; and
 - a self centering mechanism comprising at least three rings located between the left and right sides wherein:
 - a first ring is connected to the left side;
 - a second ring is connected to the first ring;
 - a third ring is connected to the second ring and to the right side.
2. The occlusion device of claim 1 wherein sutures are used to connect the first ring to the left side, the second ring to the first ring, the second ring to the third ring, and the third ring to the right side.
3. The occlusion device of claim 2 wherein the suture locations connecting the first ring to the left side are offset from the sutures connecting the second ring to the first ring, the sutures connecting the second ring to the third ring are offset from the sutures connecting the first ring to the second ring, and the sutures connecting the third ring to the right side are offset from the sutures connecting the third ring to the second ring.
4. The occlusion device of claim 1 wherein heat laminating is used to connect the first ring to the left side, the second ring to the first ring, the second ring to the third ring, and the third ring to the right side.

5. The occlusion device of claim 4 wherein the laminated locations connecting the first ring to the left side are offset from the laminated locations connecting the second ring to the first ring, the laminated locations connecting the second ring to the third ring are offset from the laminated locations connecting the first ring to the second ring, and the laminated locations connecting the third ring to the right side are offset from the laminated locations connecting the third ring to the second ring.

6. The occlusion device of claim 1 wherein the rings comprise polyvinyl alcohol foam.

7. The occlusion device of claim 1 wherein the rings comprise a non-thrombogenic material.

8. The occlusion device of claim 1 wherein the rings comprise biocompatible wire.

9. An occlusion device comprising:
a center post;
first and second sets of arms connected to the center post, the first and second set of arms comprising at least five arms;
first and second sheets attached to the first and second sets of arms respectively; and
a self centering mechanism comprising a plurality of flexible rings wherein:
a first ring is connected to the first set of arms;
a second ring is connected to the first ring;

a third ring is connected to the second ring and to the second set of arms.

10. The occlusion device of claim 9 wherein sutures are used to connect the first ring to the left side, the second ring to the first ring, the second ring to the third ring, and the third ring to the right side.

11. The occlusion device of claim 10 wherein the suture locations connecting the first ring to the first side are offset from the sutures connecting the second ring to the first ring, the sutures connecting the second ring to the third ring are offset from the sutures connecting the first ring to the second ring, and the sutures connecting the third ring to the second side are offset from the sutures connecting the third ring to the second ring.

12. The occlusion device of claim 9 wherein heat laminating is used to connect the first ring to the left side, the second ring to the first ring, the second ring to the third ring, and the third ring to the right side.

13. The occlusion device of claim 12 wherein the laminated locations connecting the first ring to the left side are offset from the laminated locations connecting the second ring to the first ring, the laminated locations connecting the second ring to the third ring are offset from the laminated locations connecting the first ring to the second ring, and the laminated locations connecting the third ring to the right side are offset from the laminated locations connecting the third ring to the second ring.

14. The occlusion device of claim 9 wherein the rings comprise polyvinyl alcohol foam.

15. The occlusion device of claim 9 wherein the rings comprise a non-thrombogenic material.

16. The occlusion device of claim 9 wherein the rings comprise biocompatible wire.

17. A method of manufacturing self centering mechanism for an occlusion device, the method comprising:
forming a centering mechanism by attaching a first ring to a second ring and attaching the second ring to a third ring;
securing the first ring to a first interior side of the occlusion device;
and
securing the third ring to a second interior side of the occlusion device.

18. The method of manufacture of claim 17 wherein sutures are used to connect the first ring to the first interior side of an occlusion device, the second ring to the first ring, the second ring to the third ring, and the third ring to the second interior side.

19. The method of manufacture of claim 18 wherein the suture locations connecting the first ring to the first interior side are offset from the sutures connecting the second ring to the first ring, the sutures connecting the second ring to the third ring are offset from the sutures connecting the first ring to the second ring, and the sutures connecting the third ring to the second interior side are offset from the sutures connecting the third ring to the second ring.

20. The method of manufacture of claim 17 wherein heat laminating is used to connect the first ring to the first interior side, the second ring to the first ring, the second ring to the third ring, and the third ring to the second interior side.

21. The method of manufacture of claim 20 wherein the laminated locations connecting the first ring to the first interior side are offset from the laminated locations connecting the second ring to the first ring, the laminated locations connecting the second ring to the third ring are offset from the laminated locations connecting the first ring to the second ring, and the laminated locations connecting the third ring to the second interior side are offset from the laminated locations connecting the third ring to the second ring.

22. The method of manufacture of claim 17 wherein the rings comprise polyvinyl alcohol foam.

23. The method of manufacture of claim 17 wherein the rings comprise a non-thrombogenic material.

24. The method of manufacture of claim 17 wherein the rings comprise biocompatible wire.

25. An occlusion device comprising:
a center post;
first and second sets of arms connected to the center post, the first
and second set of arms comprising at least five arms;
first and second sheets attached to the first and second sets of arms
respectively; and

a self centering mechanism comprising a flexible honeycomb structure surrounding the center post and connected between the first and second set of arms.

26. The occlusion device of claim 25 wherein sutures are used to connect the first ring to the left side, the second ring to the first ring, the second ring to the third ring and the third ring to the right side.

27. The occlusion device of claim 26 wherein the suture locations connecting the first ring to the first side are offset from the sutures connecting the second ring to the first ring, the sutures connecting the second ring to the third ring are offset from the sutures connecting the first ring to the second ring, and the sutures connecting the third ring to the second side are offset from the sutures connecting the third ring to the second ring.

28. The occlusion device of claim 25 wherein heat laminating is used to connect the first ring to the left side, the second ring to the first ring, the second ring to the third ring and the third ring to the right side.

29. The occlusion device of claim 28 wherein the laminated locations connecting the first ring to the left side are offset from the laminated locations connecting the second ring to the first ring, the laminated locations connecting the second ring to the third ring are offset from the laminated locations connecting the first ring to the second ring, and the laminated locations connecting the third ring to the right side are offset from the laminated locations connecting the third ring to the second ring.

30. The occlusion device of claim 25 wherein the rings comprise polyvinyl alcohol foam.
31. The occlusion device of claim 25 wherein the rings comprise a non-thrombogenic material.
32. The occlusion device of claim 25 wherein the rings comprise biocompatible wire.
33. An occlusion device comprising:
a left side;
a right side;
a center post connecting the left side to the right side and configured to extend through an aperture;
a self centering mechanism located between the left and right sides and surrounding the center post wherein the self centering mechanism fills the aperture radially around the center post.
34. The occlusion device of claim 33 wherein the self centering mechanism comprises at least three rings located between the left and right sides wherein:
a first ring is connected to the left side;
a second ring is connected to the first ring;
a third ring is connected to the second ring and to the right side.
35. The occlusion device of claim 34 wherein sutures are used to connect the first ring to the left side, the second ring to the first ring, the second ring to the third ring, and the third ring to the right side.

36. The occlusion device of claim 35 wherein the suture locations connecting the first ring to the left side are offset from the sutures connecting the second ring to the first ring, the sutures connecting the second ring to the third ring are offset from the sutures connecting the first ring to the second ring and the sutures connecting the third ring to the right side are offset from the sutures connecting the third ring to the second ring.

37. The occlusion device of claim 34 wherein heat laminating is used to connect the first ring to the left side, the second ring to the first ring, the second ring to the third ring, and the third ring to the right side.

38. The occlusion device of claim 37 wherein the laminated locations connecting the first ring to the left side are offset from the laminated locations connecting the second ring to the first ring, the laminated locations connecting the second ring to the third ring are offset from the laminated locations connecting the first ring to the second ring, and the laminated locations connecting the third ring to the right side are offset from the laminated locations connecting the third ring to the second ring.

39. The occlusion device of claim 34 wherein the rings comprise polyvinyl alcohol foam.

40. The occlusion device of claim 34 wherein the rings comprise a non-thrombogenic material.

41. The occlusion device of claim 34 wherein the rings comprise biocompatible wire.